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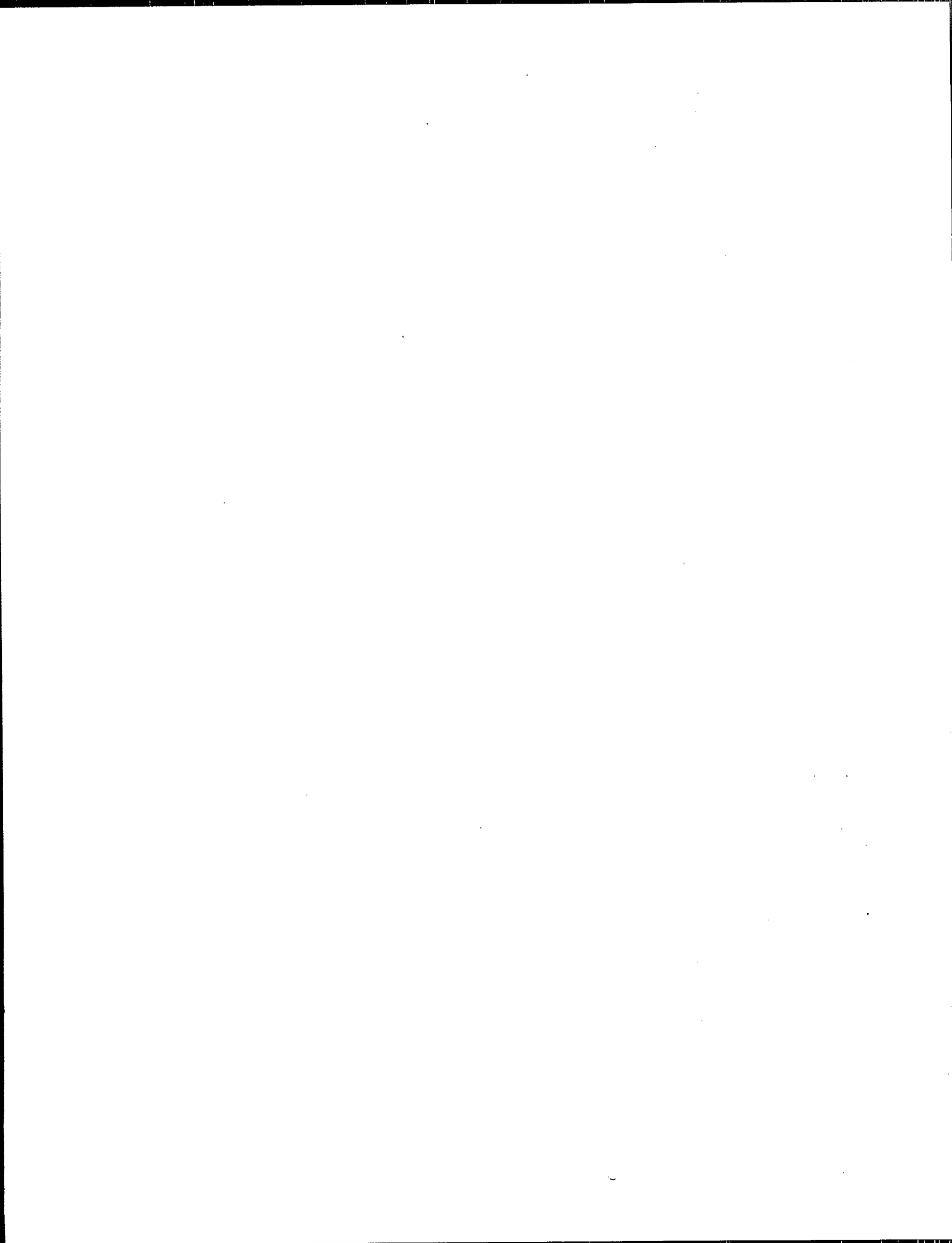
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Strategy for Hazardous Waste Minimization and Combustion



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STRATEGY FOR HAZARDOUS WASTE MINIMIZATION AND COMBUSTION

I. INTRODUCTION

The Environmental Protection Agency (EPA) is today announcing its final Strategy for Hazardous Waste Minimization and Combustion. The Strategy represents a major milestone in the Agency's ongoing commitment to determine, in the context of the Resource Conservation and Recovery Act (RCRA), how best to integrate source reduction and environmentally sound recycling into the national hazardous waste management program, and how best to assure the public of safe operation of hazardous waste combustion facilities. The Strategy is the culmination of 18 months of intensive effort by EPA and other interested parties under the Draft Strategy on Hazardous Waste Minimization and Combustion, announced by Administrator Carol M. Browner on May 18, 1993.

The Strategy sets forth EPA's fundamental goals and basic vision with respect to several key areas. First, the Strategy, in combination with the Hazardous Waste Minimization National Plan also being released today, discusses the role of waste minimization in the RCRA hazardous waste management program. Second, the Strategy addresses the role of combustion over the next 5-10 years. In addition, public involvement in the RCRA decision-making process, the need for strong compliance and enforcement, and the role of risk assessment are addressed.

The Strategy also outlines a series of actions (many already under way pursuant to the Draft Strategy) to foster a broader range of waste management options that are safe, effective, and available. The Hazardous Waste Minimization National Plan sets forth a complementary set of actions, which can and will be applied to this Strategy, to achieve significant gains in source reduction and environmentally sound recycling -- the two components of RCRA waste minimization.

II. EPA'S STRATEGIC GOALS

The backbone of EPA's Strategy are eight goals. These goals address the areas initially covered in the Draft Strategy, as amplified by the many discussions that have taken place since its release. These goals provide the policy framework for EPA's future actions and for reaching the best possible solutions to

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the issues that have arisen and will undoubtedly continue to arise concerning the management of hazardous waste in the United States. The goals presented below are not in any order of priority; they are all equally important.

- **Public Outreach and EPA-State Coordination:** Continue to facilitate an open and broad national dialogue among all stakeholders on significant hazardous waste issues. Give top priority to working with states as co-regulators of hazardous waste.
- **Waste Minimization:** Under the Hazardous Waste Minimization National Plan, reinforce strong preference for source reduction over hazardous waste management in order to reduce both the long-term demand for treatment, storage, and disposal capacity and the quantities of persistent, bioaccumulative, and toxic constituents that need to be managed. In partnership with states, industry, and local communities, pursue aggressive use of waste minimization measures with primary emphasis on voluntary actions. Afford members of the public a greater opportunity to become aware of waste minimization activities in their communities.
- **Role of Combustion and Alternative Technologies:** Maintain appropriate role for combustion, and continue to ensure that combustion and other treatment facilities reduce toxicity, volume, and/or mobility of hazardous wastes in a manner that is protective of public health. Foster the commercial development and use of alternative treatment and other innovative technologies that are safe and effective in reducing the toxicity, volume, and/or mobility of RCRA industrial process and remediation wastes.
- **Emission Standards and Controls:** Develop and impose more rigorous controls on combustion facilities based on an assessment of available technologies and current science. Develop these controls as a coordinated effort to implement both RCRA and the Clean Air Act authorities for hazardous waste combustion facilities. Ensure that hazardous waste combustion facilities do not pose an unacceptable risk to human health or the environment.
- **Enforcement and Compliance Assistance:** Continue aggressive compliance and enforcement efforts against hazardous-waste burning incinerators and boilers and industrial furnaces (BIFs) while working with industry to ensure that EPA's regulations are understood and followed. Enhance public confidence in Agency oversight activities and facility compliance by promoting public understanding of these activities and increased opportunities for public involvement in the enforcement process.

- **Public Involvement in Permit Process:** Enhance public involvement opportunities in the process for considering permit applications for combustion facilities. Take appropriate actions to ensure that local communities are fully informed about the RCRA decision-making process (including waste minimization opportunities) and have an opportunity to participate in that process.
- **Facility Permitting Priority:** Give higher priority to those facilities for which a final permit decision would result in the greatest environmental benefit or the greatest reduction in overall risk to the public. Give lower priority to permit decisions on new combustion facilities that are not replacing older facilities.
- **Risk Assessment:** Advance scientific understanding on combustion issues and risk assessment, and ensure that permits are issued at facilities in a manner that protects against unacceptable risks to human health and the environment. Use sound science in technical decision-making.

III. PROGRESS TOWARDS STRATEGIC GOALS OVER LAST 18 MONTHS

A. Draft Strategy on Hazardous Waste Minimization and Combustion (May 1993)

EPA's May 1993 Draft Strategy announced an initial set of goals and launched a series of steps to maximize reduction of the amount of hazardous waste generated and to ensure safety and reliability of hazardous waste combustion in incinerators, boilers, and industrial furnaces. The Draft Strategy enabled EPA to take a leadership role in the broad national dialogue on how to reach balanced resolution of difficult and controversial waste issues.

The Draft Strategy also served as the focal point for all interested parties to take a fresh look at how to achieve a fully integrated waste management program -- one that has the proper emphasis on source reduction and recycling and that defines the appropriate role for hazardous waste combustion. Compliance and enforcement at incinerators and BIFs also received much attention during the broad national dialogue, with particular emphasis on this subject by citizens from local communities in which hazardous waste facilities are located.

While the Draft Strategy specifically addressed only RCRA-regulated hazardous wastes, its approaches and principles have been incorporated in policies covering other areas under EPA's purview. For example, EPA developed a Superfund policy that,

among other things, adopts public participation and risk assessment features of the Draft Strategy.

For a detailed summary of significant actions and accomplishments under the Draft Strategy since May 1993, see Appendix A.

B. Public Dialogue Following Draft Strategy

Over the past 18 months, members of the public (especially citizens from the local communities in which hazardous waste facilities are located), industry, public interest groups, and state officials have played an essential role in the broad national dialogue on hazardous waste generation and management. This dialogue occurred at a 4-day National Roundtable on waste minimization and combustion held in Washington, D.C. in November 1993, at four Regional Roundtables held in April-May 1994 in San Francisco, Houston, Chicago, and Atlanta, as well as in the hundreds of informal meetings with individuals or stakeholder groups. Summaries of the discussions at the National and Regional Roundtables have been prepared and made available to the public upon request through the RCRA Hotline.

These wide-ranging but sharply focused discussions have provided significant input on many key issues. These issues have included the need for increased waste minimization, EPA's approach for upgrading regulatory controls on combustion units, the desire for flexible means to enhance public participation in permitting and to address environmental justice concerns, and the importance of aggressive, credible compliance and enforcement at combustion facilities.

This public dialogue has made it clear that EPA and other stakeholders share two fundamental goals: (1) to foster the maximum amount of source reduction and environmentally sound recycling for all wastes (not just combustible waste); and (2) to ensure that any waste management practices, including combustion, are done in a manner that is protective of human health and the environment. In that regard, a group of proactive companies and organizations have come forward voluntarily and worked with the Agency to meet the objectives of the Draft Strategy even without regulatory or other mandatory requirements. These voluntary initiatives, which have the potential for leading to significant environmental actions, are discussed in Appendix B.

This dialogue has also illustrated that not everything is known at this time about waste minimization and combustion to the level of detail that the Agency and the public would wish. As a result, the best solutions to some issues may not have yet emerged. Where there still remain unanswered questions, the Strategy outlines steps to develop the needed information. During this time, the Strategy and actions under its umbrella

will provide protection of public health and the environment.

IV. RCRA PROGRAM EVOLUTION AND CURRENT SETTING

A. RCRA Program Evolution

The RCRA program and hazardous waste management practices have evolved together in several stages. Before 1980, hazardous wastes were virtually uncontrolled. Anecdotal information on prevalent practices suggests that landfilling, deep well injection, surface impoundments, and incineration were major avenues of management. From 1980-84, the RCRA regulatory framework was put into place, and set design and operating standards for these and other types of waste management practices. However, the Hazardous and Solid Waste Amendments of 1984 (HSWA) singled out land disposal practices for special attention and significant restrictions. Free liquids could no longer be put into landfills, disposal in unlined and unmonitored landfills and surface impoundments began to be phased out, and meeting Best Demonstrated Available Technology (BDAT) treatment standards prior to land disposal was mandated. Further, under the Loss of Interim Status or "LOIS" provisions of HSWA, hazardous waste landfills and surface impoundments had to file permit applications within specified time periods and also had to certify compliance with RCRA groundwater monitoring and financial responsibility standards in order to remain in operation.

As land disposal BDAT treatment standards were promulgated through the late 1980's, many were based on levels achievable by combustion technologies. Management of hazardous waste via incinerators and BIFs increased, particularly with respect to organic-bearing waste streams. At the same time, the universe of incinerators shrunk from 1987-1991 from about 305 facilities to about 192 facilities (due mainly to permit denials and facilities that voluntarily closed rather than meet RCRA standards). In addition, generators were pursuing source reduction and recycling, at least in part due to rising treatment and disposal costs and to long-term Superfund liability for waste generators. These all combined to accelerate the emphasis on source reduction and recycling as well as the use of combustion.

In the late 1980's and early 1990's, combustion capacity significantly exceeded demand, primarily for liquids. Prices for burning waste dropped substantially (e.g., between 1991-1993, the price for solids incineration went from about \$1225 per ton to about \$900 per ton). Furthermore, waste volumes dropped in response to waste minimization efforts. Companies consolidated, and emphasis on affording customer-oriented services and technologies began to move to the forefront as significant characteristics of waste management companies. At the same time, questions about the risks from combustion began to surface with

greater frequency. The indirect risk pathway (e.g., exposure via the food chain) was recognized as a particularly important aspect of assessing the safety of combustion facilities.

B. Current Setting

As discussed in greater detail in Appendix C, there currently exist 162 permitted or interim status incinerators (28 commercial) and 136 interim status BIFs (38 commercial). An additional 26 incinerators (5 commercial) and 3 BIFs are proposed and have applications on file for hazardous waste permits.

Since the Draft Strategy was announced, the universe of existing and planned facilities has been somewhat dynamic. For example, 9 commercial incinerators and BIFs have cancelled plans to burn hazardous waste, but 9 new applications were submitted (2 for commercial units). Three permits were denied by EPA and/or the states (National Cement in California (on appeal), Marine Shale Processors in Louisiana (on appeal), and Maybelline Products in Arkansas) while one permit was issued by Texas (American Envirotech). Over the coming years, EPA anticipates that the number of final permit determinations made annually will be around 20 (but perhaps up to 40) per year. This projection is based, in part, on EPA's view that the pace of permit decisions will increase as the EPA regional staff and state personnel gain more experience and familiarity with the comprehensive risk assessment procedures introduced over the past year.

EPA estimates that the current universe of 298 permitted and interim status combustion facilities represent a potential capacity to burn over 4.8 million tons of waste annually. At the present time, this represents about 1.2-1.4 million tons of excess capacity over demand. Most of this excess capacity is for liquid hazardous waste, perhaps as much as 1.1 million tons. However, it is important to note that even though excess capacity may exist on an aggregate national basis, capacity can be limited in certain regions of the country or for certain types of waste. For example, due to unusual physical form or particular constituents, wastes that are explosive or mixed radioactive waste may require specialized forms of combustion or other treatment that are not widely available.

In terms of future capacity, the hazardous waste treatment and disposal market has generally responded in a fashion that has assured adequate available combustion capacity. The Agency has found no reason thus far to believe that this will not continue, even with respect to increased volumes of remediation waste, which can be generated in substantial amounts over relatively short time periods with less advance knowledge than most industrial process wastes.

V. DEVELOPMENT OF FINAL STRATEGY

A. Role of Waste Minimization

1. EPA's Hazardous Waste Minimization National Plan

As discussed in the Draft Strategy, EPA and interested parties have spent much of the past 18 months examining ways to best integrate waste minimization into the hazardous waste management program under RCRA. The dialogue has been fruitful in many ways, and has served to reinforce the pre-eminence of source reduction and environmentally sound recycling in the RCRA hierarchy for hazardous waste. The result of this dialogue has been development of the final Hazardous Waste Minimization National Plan, which is also being released today.

EPA's waste minimization approach is presented in detail in the National Plan. The National Plan has been subject to public evaluation and debate since its release in draft form in May 1994. This Plan, which will be implemented in concert with the Strategy, creates the framework for the waste minimization activities under RCRA and will guide the Agency's efforts to integrate waste minimization into the other facets of our national waste management program. Key components of the Plan include establishment of national goals and priorities for source reduction and recycling, identification and evaluation of source reduction and recycling opportunities, mechanisms to achieve the national goals and measure progress, and implementation steps.

The National Plan indicates that EPA will promote source reduction and environmentally sound recycling for the waste constituents that present the greatest potential hazard to human health and the environment. Efforts to evaluate potential hazard will continue to center around an analysis of the persistence, toxicity, bioaccumulation, and mass of hazardous constituents in waste streams. However, within this overall context, EPA will give an initial implementation priority to actions leading to removal of high hazard metal constituents from wastes destined for combustion. This comports with the views expressed by many parties involved in waste minimization discussions that metals in combustible waste streams were appropriate toxic and persistent compounds to focus upon at the outset.

Other noteworthy aspects of EPA's National Plan include:

- o EPA establishes goals and time frames for waste minimization progress on a national basis. We set as a goal the reduction of the most persistent, bioaccumulative, and toxic constituents in hazardous waste by 25% nationally by the year 2000, and by 50% nationally by the year 2005. Generators will have the flexibility to set facility-specific goals and to track their own progress in a manner

that contributes to the overall national goals.

- o The National Plan will be implemented through a mix of voluntary and regulatory measures to achieve the maximum amount of source reduction and recycling of the targeted waste streams containing these constituents, with a clear emphasis on the voluntary measures during initial implementation. However, EPA will use the year 2000 as a benchmark to evaluate whether more aggressive measures are warranted.
- o The National Plan emphasizes the importance of keeping the public informed and involved. To that end, EPA is including in its 1991 Biennial Report a list by geographic location of large quantity generators that were required to certify in 1991 that they had a waste minimization program in place. This will empower citizens with sufficient information to determine which facilities are in their vicinity and to begin the dialogue with those companies about waste minimization.
- o Measuring success in the waste minimization area raises a number of difficult questions, such as what data are necessary, what baseline to use, and how to account for significant external influences. The National Plan lays out a flexible process by which the progress on waste minimization is not delayed by debate over the single best way to measure progress. Rather, the emphasis will shift to making progress in an aggregate national manner and to allowing flexibility for specific facilities to take into account their unique circumstances within the overall national picture.

2. Application of Waste Minimization National Plan to Combusted Hazardous Wastes

Setting Priorities: As discussed above, one of the key components of the National Plan is setting priorities. In the Addendum to the National Plan, EPA applies a screening methodology, based on the persistence, bioaccumulation, toxicity and mass of constituents in hazardous waste and releases, as a tool to help set our national priorities for source reduction and environmentally sound recycling. Based on the screening methodology, we identify metals in hazardous wastes managed by combustion as well as metals in releases from combustion facilities as EPA's initial national priority. This screening tool is a prototype for a broader screening tool under development that will address persistent, bioaccumulative and toxic constituents in a broad spectrum of wastes and releases. Results from applying the prototype will serve as a point of departure for EPA Regions, States, and industry in establishing their own priorities, in the context of this overall Strategy.

Identification and Evaluation of Waste Minimization

Opportunities: Following the establishment of priorities for source reduction and recycling as described above, the next key aspect of the National Plan is identification and evaluation of opportunities for source reduction and environmentally sound recycling. While most of the detailed analysis of technical and economic feasibility of alternatives will be conducted at a plant level by generators and/or technical assistance centers, EPA has information related to feasibility of certain opportunities, at least on a broad national level. The following discussion focuses on several general types of waste streams that are being combusted, and suggests areas that generators and others can evaluate.

EPA believes that the hazardous waste regulations enacted since 1980 have, by themselves, created significant incentives for waste minimization, due to their alteration of the economics of waste management. Given this and also the current economic influences acting upon hazardous waste generators, many of the obvious waste minimization opportunities yielding short-term cost savings, particularly for larger businesses, are likely being investigated and implemented. However, other waste minimization opportunities may not be sufficiently investigated or implemented, particularly at smaller size businesses, due for example to lack of access to information, lack of available capital, and other factors.

For hazardous wastes being combusted, there are likely to be certain waste minimization opportunities which still may not have been fully explored. Two such candidates are lean waters and organic liquids. Both lean waters and organic liquids are among the metal-containing waste streams addressed in the Addendum to the Waste Minimization National Plan.

Lean waters generally are aqueous liquids lightly contaminated with organics. EPA's 1991 Biennial Reporting System (BRS) data indicate that "aqueous wastes with low solvents," a subset of lean waters, constitute one relatively high volume waste stream being managed through combustion. Examples of potential source reduction alternatives for this waste stream include switching from chlorinated solvents to mineral spirits or water-based solvents, improved housekeeping, better inventory control, and waste stream segregation. We do not know what factors are influencing generators to send these lean waters to combustion or how much source reduction is actually possible. However, some evidence from Ohio supports the idea that aqueous wastes offer significant potential for source reduction. Approximately one quarter of the source reduction reported to the Ohio EPA for 1991 involved aqueous wastes with low solvent concentrations. This will likely be an area of further investigation during implementation of the Hazardous Waste Minimization National Plan.

Organic liquids contain higher concentrations of organics than lean waters. Given that the 1991 BRS data suggest that over 300,000 tons of higher concentration organic liquids are being managed, these liquids may also present opportunities for source reduction or, if source reduction alternatives are not feasible, for significant, environmentally sound recycling. It has been pointed out to the Agency that a number of factors may influence whether recycling of organic liquids (e.g., spent solvents) is feasible. For example, some generators may be inhibited by potential liability associated with off-site solvent recycling practices that give rise to releases of hazardous substances. They appear to believe that combustion offers them more security from future liability. Another factor that may discourage on-site recycling is the desire of generators to avoid the cost and delay of associated permitting (which can take one to three years). In many cases, the generator would rather send spent solvent to an industrial boiler or furnace for combustion/energy recovery. A third example is the situation in which the combined cost of raw material purchase and waste handling was less for virgin solvents than for recycled solvents. Under these market and regulatory conditions, a company would be likely to use virgin solvent in its production process, and send its used waste solvent to an industrial boiler or furnace for combustion/energy recovery.

Other opportunities for waste minimization may exist with respect to hazardous wastes that are not routinely-generated process wastes, such as residues from air pollution control devices, residues from waste treatment systems, and still bottoms from solvent recovery units. If identified as a high priority for minimization based on hazard, these wastes would likely require additional effort to assess the potential for source reduction and/or recycling.

In assessing waste minimization opportunities over the next 5-10 years, it is also relevant to consider several potential future trends affecting quantities and characteristics of wastes going to combustion:

- o Establishment of LDR treatment standards that have or may, in the future, be based on levels achieved by combustion (e.g., Phase II rule (just issued), the Phase III rule (1996), the Phase IV rule on industrial surface impoundments (1997-1998), new waste listings (1996-2005), and remediation wastes). Very preliminary estimates are that new waste listings could introduce approximately 100,000 to 400,000 tons of hazardous waste per year going to combustion. Depending on the nature of these listings, industry may be encouraged to investigate source reduction opportunities.
- o More rigorous emissions standards for combustion units, now scheduled for finalization in late 1996, may increase waste management costs for generators, encourage further waste

minimization efforts, and ultimately reduce some of the demand for combustion.

- o As generators extend the period of use and reuse of organic and aqueous-based solvents to avoid treatment and disposal costs, solvent wastes will have a higher solids content. Still bottoms from solvent recovery may also have a higher solids content as solvent recovery operations are pushed to increase recovery rates.
- o Some special waste streams (e.g., radioactive mixed waste, waste explosives, and chemical munitions) may continue to warrant incineration and would not be expected to change in character. However, sufficient capacity will be needed only in particular times frames for certain of these wastes, for example, 10 years for chemical munitions due to treaty limitations.

These factors as well as many others (such as regulatory barriers, capital availability, and technological innovation) make it difficult to predict the feasibility of future source reduction and environmentally sound recycling opportunities for wastes destined for combustion. The Hazardous Waste Minimization National Plan provides an overall program framework for identifying those opportunities as they arise and for providing sufficient flexibility to use various mechanisms in pursuing those opportunities.

B. Role of Combustion and Potential Alternatives

In assessing the respective roles of combustion and potential alternatives, several key elements need to be evaluated. These include: (1) ability to achieve permanent reductions in waste volume, toxicity and/or mobility; (2) ability to treat or manage organic fluids, solids, and sludges in a safe manner; (3) timely availability of the technology for the amounts of hazardous wastes being generated; and (4) risks posed by residuals from the process or from long-term management.

From a technical standpoint, combustion of hazardous waste is a single, stand-alone process that substantially and permanently reduces the toxicity and volume of virtually all organic-bearing waste streams, principally by destroying organic compounds. In addition, unlike many other waste treatment processes, combustion in incinerators and BIFs can accommodate a wide variety of waste matrices -- liquids, solids, and sludges. Residues from combustion are generally amenable to land disposal, often more so than the original waste streams. Finally, combustion is a demonstrated and commercially available technology for which considerable design and operational experience exists.

Despite these technical attributes, a great deal of controversy has arisen over the use of combustion for hazardous waste. Combustion facilities emit trace levels of toxic organic compounds that are not fully destroyed during combustion, or that may be formed downstream of the combustion chamber. Trace levels of metals may also be emitted. The controversial issues fall primarily in two major categories: (1) ensuring proper treatment/destruction through good combustion and ensuring that facility emissions do not exceed regulatory limits, and (2) more fully characterizing the risks from combustion emissions.

First, EPA seeks to ensure that the combustion chamber is operated in a manner that represents "good combustion," i.e., proper destruction of organic compounds. Because of current technical difficulties of measuring destruction in the combustion chamber itself, EPA's approach is to monitor various parameters (e.g., temperature, CO or O₂) that are indicators of how well the waste is being combusted. Thus, the first category of technical issues contains questions related to selecting and using the best parameters as indicators of combustion efficacy. To address this issues, EPA is committed, among other things, to: (1) reviewing trial burn procedures to ensure that they result in fully protective operating conditions, and (2) developing emission monitors that sample and analyze emissions continuously. Other actions are detailed in Section VI below.

Second, there are questions about air emissions for which we do not have complete answers. These issues revolve primarily around an understanding of the full suite of pollutants (e.g., products of incomplete combustion or "PICs") emitted by hazardous waste combustors and of the indirect exposure pathways. For example, only limited PIC testing has been done at full-scale facilities. Lab-scale and full-scale testing has been initiated, but will take the next several years to provide us with complete and verified answers that can be the basis of specific regulatory limits. The current approach relies, if actual emissions data are unavailable, upon conservative assumptions about operating conditions (e.g., waste feed) in conducting facility risk assessments to ensure that the facility can be operated in a protective manner. However, in light of the public concern about this approach, it is advisable to conduct further analysis on the nature and toxicity of combustion emissions and their contribution to overall risk. In that regard, EPA will be taking steps (as detailed in Section VI. below) to: (1) better characterize organic emissions (including PICs), and (2) use multi-pathway risk assessment procedures. These steps are consistent both with the Agency's overall efforts pursuant to the Dioxin Reassessment as well as with the efforts of the Office of Solid Waste (OSW) and the Office of Research and Development (ORD) to better assess indirect risks from both toxic metals and organics, particularly from hazardous waste combustion facilities.

Alternative treatment and other innovative technologies afford significant opportunities for addressing hazardous wastes, particularly in the remediation context in which many of these alternatives have been developed. Some of the alternative treatment technologies reduce toxicity or volumes of hazardous waste streams, a key point of comparison for RCRA wastes that would otherwise be combusted in incinerators and BIFs. Other innovative technologies can help achieve source reduction and/or environmentally sound recycling.

However, of the limited alternative treatment technologies commercially available today or those expected to be available over the next 5-10 years, none have been shown provide a stand-alone alternative that is entirely comparable to combustion in the degree of toxicity reduction, process efficiency, permanence, and adaptability to a wide variety of waste matrices. A few existing technologies provide some of these characteristics, but not all. Hence, a primary benefit of these alternative treatment technologies over the next 5-10 years may be as pretreatment to reduce the volume of wastes that would be combusted, for example by separating organic constituents from more complex waste matrices. EPA is making a commitment in this Strategy to identify and explore ways to address barriers that stand in the way of commercial development and use of safe and effective alternative technologies, including both those that reduce toxicity and/or mobility of waste as well as those that would promote source reduction and/or recycling of waste. EPA will also emphasize with technology developers the need to properly characterize actual and potential releases of hazardous constituents when testing out innovative treatment technologies.

Source reduction and recycling will certainly be pursued under the Hazardous Waste Minimization National Plan, but cannot be expected to eliminate the need to combust certain wastes over the next 5-10 years, particularly organic-bearing waste streams. Apart from alternative treatment technologies, the alternative conventional management options for organic-bearing waste streams now going to combustion are limited -- increased landfilling (with liquid wastes being containerized and held with sorbents), deep well injection, release to wastewaters, and perhaps some landfarming. Long-term storage in concrete vaults, as advocated by some, is not an acceptable alternative both from a risk perspective (due to containment failure and increased threat to groundwater) as well as from an implementation standpoint (due to immediate legislative change required that would allow such long-term storage). In addition, although these alternative conventional management options may avoid some of the air-based inhalation and indirect risks from combustion, they would add long-term soil and ground water-based risks to the equation. Furthermore, to the extent that organics are land disposed in lieu of being combusted, the overall risk from volatilization from land-based management units would be increased over current

risk levels. In sum, virtually all of these alternative management options (including long-term storage) would involve a reversal of current practices that seek permanent solutions through treatment to reduce toxicity and mobility (and bioaccumulation potential at the same time). EPA does not believe that such a reversal is proper.

As a result, the degree to which toxic emissions from combustion facilities are controlled is the single most significant factor in comparing the risks from combustion-oriented waste management against those from alternative management scenarios. EPA recognized in the Draft Strategy that the emissions standards should be upgraded. In addition, State and federal agencies need to ensure that combustion facilities are in compliance with all regulatory standards, both from the standpoint of assuring protection of human health and the environment and from the standpoint of having public confidence that their health is being properly protected. If properly designed and operated in compliance with tough regulatory standards, combustion is a technology that provides sound management of hazardous waste and, to varying degrees, recovery of energy values. However, to remain an integral part of the national waste management program, EPA believes that combustion facilities must be operated in the best possible manner and be equipped with the protective air pollution control and real-time monitoring devices. In addition, the barriers to commercial development and use of safe and effective alternatives to combustion (including innovative technologies to reduce hazardous constituents in waste) need to be identified and addressed, so that broader choices are available for the RCRA industrial waste universe in the future.

VI. IMPLEMENTATION OF EPA'S STRATEGIC GOALS

EPA has already undertaken a number of actions to implement the goals of the Strategy, and will be initiating others. The sections that follow provide both a brief and selective recap of EPA's actions to date and a more detailed picture of EPA's plans for achieving each of the Strategic Goals.

[NOTE: A more detailed summary of EPA actions to date is contained in Appendix A.]

A. Public Outreach and EPA-State Coordination:

EPA has held one national and four regional roundtables (in addition to hundreds of individual meetings) on source reduction, recycling, combustion, public participation, enforcement and other issues over the last 18 months. In response to citizen requests for greater availability of information on the Draft Strategy, EPA has made key documents available on electronic

networks and has begun a Strategy Update newsletter. The Newsletter is currently mailed to over 3000 people who have attended any Agency meeting on the Strategy or who have otherwise made their interest known (e.g., via telephone calls, letters, etc.).

EPA and the States have also created an EPA-State Steering Committee on Hazardous Waste Management to discuss significant policy issues, including source reduction, recycling, public participation, and combustion. State representatives are being included on all EPA workgroups that are pursuing particular projects in these areas.

To continue our commitment to broad public outreach and to EPA-State coordination, EPA will take the following actions:

- o Actively solicit the public and stakeholders group opinions and factor them into Agency decision-making in a manner that provides for broad and open dialogue.
- o Provide an enhanced level of information to the public and stakeholder groups through the Newsletter and electronic media. EPA will also explore use of information outreach programs and technical assistance to local communities.
- o Continue to involve members of the EPA-State Steering Committee on significant policy and technical issues.
- o Bring state representatives into EPA planning efforts and work groups early in these processes.

B. Waste Minimization:

EPA's public dialogue on waste minimization goals, approaches, and implementation has not only included the national and regional roundtables, but has recently occurred in the context of focus groups assembled to discuss the Draft Hazardous Waste Minimization National Plan, released in May 1994. This dialogue has resulted in significant advances during development of the final National Plan, which is being released today as the framework for future actions to reduce the persistent, bioaccumulative, and toxic constituents in hazardous waste.

EPA continues to place emphasis on waste minimization in our waste management thinking. EPA will take the following actions:

- o Issue and, with EPA Regional and State lead, aggressively implement the Hazardous Waste Minimization National Plan. Under the National Plan, EPA will:

-- Focus efforts on industrial sectors and processes

producing waste streams that contain persistent, bioaccumulative and toxic constituents that represent the highest risk, with an initial emphasis on toxic metals in combustible waste streams.

- Look closely at other waste streams that contain persistent, toxic, and bioaccumulative constituents (e.g., those with halogenated organics) in the near future.
 - Implement measures to achieve the overall goals for source reduction and environmentally sound recycling and for generator participation set forth in the National Plan.
 - Provide for sufficient individual company flexibility to harness the creative thinking of American industry in finding source reduction opportunities.
 - Maximize use of voluntary partnerships and programs among industry, the public, and regulatory agencies in implementing the National Plan.
- o Issue final "Waste Minimization Program in Place" guidelines.
 - o Enforce the RCRA waste minimization certification requirements at large quantity generators and TSDFs, and continue to encourage facilities to make their waste minimization programs available to the public.
 - o Revisit after several years the mechanisms used to pursue waste minimization under the National Plan to determine whether satisfactory progress in source reduction and environmentally sound recycling is being made.
 - o Provide technical assistance on waste minimization issues.
 - o Provide opportunities for widespread public recognition of industry success in source reduction of hazardous wastes.

C. Role of Alternative Technologies:

Over the past 18 months, EPA and interested parties have explored the appropriate role for combustion and, to a lesser degree, alternative treatment and other innovative technologies, in our national hazardous waste program. This has been accomplished in the national and regional roundtables as well as in numerous individual meetings.

The dialogue among stakeholders has made it very clear that combustion facilities must be designed and operated in the best possible manner and be equipped with the most protective air pollution control technologies feasible. Alternative treatment

and other innovative technologies afford potential but as yet unrealized opportunities for reducing or treating hazardous industrial wastes to reduce toxicity, mobility, bioaccumulation, and mass. Thus, barriers to commercial development and use of safe and effective alternatives to combustion need to be identified and addressed to broaden our choices for managing the RCRA industrial waste universe in the future. In addition, EPA will include in this effort an examination of the potential role for innovative technologies designed to prevent the generation of hazardous constituents in waste.

To achieve these objectives and our overall goals, EPA will take the following actions:

- o Evaluate and determine how best to address barriers that may exist in the RCRA program (and possibly elsewhere) against commercial development and use of alternative treatment and other innovative technologies that can reduce the toxicity, mobility, persistence, bioaccumulation, and/or volume of hazardous constituents in a safe and effective way. EPA will also emphasize the need to properly characterize actual and potential releases of hazardous constituents when testing out treatment and other innovative technologies.
- o Ensure better cooperative work on gathering data and assessing alternative treatment technologies among EPA offices and with outside parties.
- o Take better advantage of energy recovery opportunities through EPA's workgroup efforts considering development of a "clean fuel specification," which could potentially modify the management practices applicable to some wastes that do not warrant the current full set of regulatory controls.

D. Emission Standards and Controls:

As the result of both the national dialogue on technical issues regarding proper controls for hazardous waste combustion devices and a significant amount of EPA technical work over the last 18 months, EPA released for public review in May 1994 its preliminary analysis of achievable emission levels for dioxins, furans, and particulate matter (PM) (the "Combustion Emissions Technical Resource Document" or CETRED). EPA's Office of Solid Waste (OSW) and the Office of Air Quality Planning and Standards (OAQPS) are coordinating efforts in the development of proposed rules to set emission standards for hazardous air pollutants. These rulemakings will take into account the public comments received on CETRED, and will focus on the development of standards for sources that are burning hazardous waste, such as

incinerators, cement kilns, light-weight aggregate kilns, boilers, halogen acid furnaces, and other types of industrial furnaces.

In addition, over the past 18 months, EPA regions and states have examined pending facility permit applications to determine whether use of the RCRA omnibus permit authority to apply additional permit controls beyond those required under the current regulations is necessary to ensure that emissions of hazardous constituents do not pose an unreasonable risk to human health and the environment.

In the Draft Strategy, the Agency identified 30 ng/dscm of dioxins and furans and 0.015 gr/dscf particulate matter (PM) as goals and targets until upgraded technical standards were adopted. Since then, the Agency has done additional analysis on achievable dioxin and PM levels. For example, CETRED identifies 0.1 ng TEQ/dscm dioxin and 0.005 gr/dscf PM as levels that have been achieved by existing hazardous waste combustors. By way of perspective, the proposed emissions guidelines for existing municipal waste combustors (MWCs) are 0.5 ng TEQ/dscm dioxin and 0.012 gr/dscf PM for large MWCs, and 1.0 ng TEQ/dscm dioxin and 0.030 gr/dscf PM for small MWCs. Proposed new performance standards for both large and small MWCs are 0.2 ng TEQ/dscm dioxin and 0.007 gr/dscf PM.

EPA's basic goal remains to have hazardous waste combustion facilities achieve low emission levels that protect human health and the environment. Until the technical standards rulemaking is proposed, the EPA and state permit writers should use risk assessments and RCRA omnibus authority in developing permit conditions to limit emissions on a case-by-case basis as necessary to ensure protection of human health and the environment, and should work with facilities to develop and use best operating practices to achieve low emission levels.

To continue to ensure that hazardous waste burning incinerators and BIFs are well-operated in a manner that protects human health and the environment, EPA will take the following actions:

- o Continue to build on its technical data base on emissions from hazardous waste combustion devices, including the use of coordinated governmental and industry testing and, if necessary, through the use of compulsory data-gathering mechanisms.
- o Develop and promulgate rules that impose more rigorous controls on combustion facilities based on an assessment of available technologies and most current science. The proposed rule is scheduled for September 1995, with a final

rule scheduled for December 1996. Our intent is to develop this rule in a coordinated manner under both RCRA and the Clean Air Act authorities.

- o After the proposed rule to upgrade emission standards is published, in appropriate permit actions, implement the proposed emission standards and controls through use of omnibus permit authority as necessary to protect human health and the environment. Encourage all combustion facilities to implement the proposed standards to reduce emissions as quickly as possible.
- o Implement final rule in a manner that achieves the greatest possible immediate reduction in dioxins, furans, and metal emissions at all hazardous waste combustion facilities, including consideration of whether and how to reopen and modify existing permits as appropriate.
- o Enhance current efforts, both inside and outside EPA, to test continuous emission monitors for toxic organics and metals and to stimulate their commercial availability within the shortest possible time. Explore how these CEMs can be installed at hazardous waste combustion facilities as soon as possible and in a manner that affords public access to the monitoring results.

E. Enforcement and Compliance Assistance:

To enhance compliance by hazardous waste incinerators and BIFs with regulatory requirements, since May 1993, EPA has undertaken three major enforcement initiatives in conjunction with the States. The initiatives involved 51 complaints and 43 settlements, all of which addressed hazardous waste combustion violations. The enforcement actions proposed over \$31.5 million in new civil penalties, while collecting nearly \$6 million in settlement of ongoing actions.

In addition, EPA and the States inspected 255 combustion facilities between March 1, 1994 and September 30, 1994. Of these inspections, 115 were at BIFs and 140 at incinerators. Many facilities have been inspected a number of times.

The three enforcement initiatives complement other steps EPA has taken, or is the process of undertaking, to work with industry to ensure that EPA's regulations are understood and followed. As part of the national dialogue and roundtables on combustion, EPA and the States heard from community groups and individual citizens that better opportunities should be afforded for public information and involvement in compliance assistance and enforcement activities. In addition, industry also demonstrated a willingness to engage in preventive, compliance-

oriented activities with the Agency.

To enhance such opportunities, EPA has held compliance workshops with industry groups, and will seek to increase the public's understanding of, and involvement in, the hazardous waste regulations and the enforcement process. For example, in October 1994, EPA released an OSW memorandum explaining the regulatory requirements for intermediate waste treatment/fuel blending operations that handle combustible and other wastes.

To continue these efforts, EPA will take the following actions:

- o Continue to target hazardous waste handling and combustion facilities for inspections, and aggressively enforce against violators to promote deterrence and return facilities to compliance. EPA also intends to reevaluate how best to address facilities with a record of repeated violations, including the use of legal authorities enabling EPA to shut down such facilities.
- o Provide enhanced compliance and enforcement training for Regional and State enforcement personnel, including the development of user-friendly computer-based video training materials by FY 1996. These materials will also be provided as appropriate to the regulated community.
- o Continue to reassess and, as appropriate, revise current policies and procedures to maximize facility compliance. EPA plans to develop user-oriented guidance documents as well as clearer regulations and permit provisions. These would foster and maximize proactive facility compliance. One of these documents, a draft Guidance on Waste Analysis Plans for BIFs, will be released in late November or December 1994 for public review and comment. When finalized, this document is expected to help combustion facilities to better characterize their wastes prior to burning.
- o Another compliance assistance tool being developed by EPA for release in December 1994 or early 1995 is the transcript from the joint CMA/EPA BIF Workshop. The transcript contains answers to specific questions on compliance raised by CMA members regarding the BIF rules.
- o Increase public confidence in Agency oversight activities and facility compliance by enhancing public understanding of these activities and promoting public involvement. EPA will consider: (1) including provisions in hazardous waste settlement agreements to establish citizen advisory committees or to create publicly accessible, real-time "on-line" compliance monitoring systems; and (2) expanding the

use of pollution prevention and waste minimization strategies in consent agreements through compliance requirements and Supplemental Environmental Projects (SEPs).

- o A "Plain Language Guide to EPA Administrative Enforcement" is being prepared to better inform the public how EPA's administrative enforcement process works, the rights and responsibilities of the parties involved and the public, and the factors EPA considers under the statute and the RCRA Civil Penalty Policy in proposing penalties and settling cases. This Guide is currently scheduled for release in early 1995.
- o Explore means to have continuous emission monitors (CEMs) installed at combustion facilities as soon as CEMs are commercially available. The Agency intends to do so in a manner that ensures prompt and open public access to facility compliance information.

F. Public Involvement in Permit Process:

As noted in many places in this Strategy, perhaps the primary cornerstone of EPA's approach has been to ensure that local communities and citizens are heard -- both in the discussions on national policy as well as in individual facility-related activities. EPA published a major proposal in May 1994 to revise the RCRA rules to ensure that the public has a greater opportunity to participate in the permitting process and to better address limiting operations at facilities that fail trial burns conducted during interim status. EPA also directed Regions and States to begin immediate implementation of this proposal to the extent legally permissible.

In addition, EPA's Office of Solid Waste convened a task force in early 1994 to explore avenues to address a number of environmental justice and facility siting concerns that had arisen, including at the 1993-94 national and regional roundtables on the Draft Strategy. The work of this task force has led to the initiation of a number of additional activities that complement the proposed changes to RCRA permitting rules contained in the May 1994 proposal.

Enhancing public involvement opportunities remains one of the Agency's highest priorities for all of its activities. With respect to the areas addressed in this Strategy, EPA will take the following actions:

- o By summer 1995, finalize rule to enhance general public involvement opportunities in process for considering permit applications for combustion and other RCRA facilities, and

to better address limiting operations at facilities that fail trial burns during interim status.

- o Continue to work with regions and states to implement measures designed to maximize community-based public involvement in RCRA permitting and compliance/enforcement decisions, consistent with EPA Assistant Administrator Laws' memorandum of May 1994 about immediate implementation of some portions of proposed rule to enhance public involvement in permitting.
- o Continue to implement recommendations of the OSWER Environmental Justice Task Force in a manner consistent with the overall Agency approach to environmental justice and public involvement concerns. In particular, EPA will continue efforts of a recently-initiated RCRA siting work group to explore an upgrade to current RCRA facility location standards. EPA will also continue work on the Office of Solid Waste study on demographics around hazardous waste incinerators and BIFs.

G. Facility Permitting Priority:

The Regions and States have now called in all permit applications for commercial BIFs that are currently operating under interim status. These permit applications have received high priority for review and processing. In addition, Regions and States have begun to call in some applications for the remaining non-commercial facilities as time and resources allow. At the same time, some existing permits for incinerators have reached the end of their permit term and are in the process of renewal evaluation. Permit applications and actions for new facilities and expanded capacity at existing facilities have been given low priority over the last 18 months if those new facilities would not replace existing combustion capacity. Appendix C contains details on the universe of hazardous waste incinerators and BIFs and the permitting activity in this universe over the last 18 months.

In general, EPA expects that permitting for existing interim status combustion facilities will continue to be given higher priority and permitting of new, non-replacement capacity will continue to be given lower priority. We also wish to afford flexibility to the Regions and States that would allow them to give priority to other permit applications (e.g., for permit renewals) that would result in the greatest environmental benefits or the greatest reduction in overall risk to the public. To implement this approach, EPA will take the following actions:

- o Assist regions and states in giving higher priority to those facilities for which a final permit decision would result in

the greatest environmental benefits to the surrounding community or the greatest reduction in overall risk to the public. Permit renewals may be considered within the high priority category if they meet these priority criteria.

- o Maintain current policy of low priority for work on applications involving new, non-replacement combustion facilities.
- o Recommend to Regions and States that the call-in of all outstanding permit applications be consistent with the permitting priority approach of this Strategy to avoid the triggering of permitting time requirements that may divert resources away from high priority permit actions. However, the Agency's overall goal is to have Regions and States call in all combustion permit applications within the shortest possible time.

H. Risk Assessment:

The Draft Strategy established the general policy that risk assessments, which include indirect exposure pathways, should be performed prior to final permit determinations for all hazardous waste combustion facilities. At this point, about 10 risk assessments have been reviewed by EPA headquarters and regional experts and about another 30-40 are under way at individual facilities. To assist in this effort, EPA published two significant technical documents -- a draft Addendum to the 1990 ORD indirect risk guidance and a draft OSW combustion facility risk assessment guidance (including a risk screening protocol). These documents incorporated the latest information pertinent to performing risk assessments, particularly with respect to indirect exposure pathways, which the draft Dioxin Reassessment and other documents have shown to be very significant in connection with combustion facilities.

EPA remains committed to the goal of advancing scientific understanding on combustion issues and risk assessment. EPA will take the following actions:

- o Continue the current policy that risk assessments should be completed prior to making final permit determinations.
- o Release by early 1995 an updated version of the OSW implementation guidance, which takes into account regional and state experience and comments over the last 6-12 months. EPA will also develop a user-friendly spreadsheet for the risk screen procedure as a future supplement to the guidance.
- o Continue availability of HQ-Regional Risk Assessment Review

Team in scoping, performing, and/or reviewing risk assessments for the near future until the Regions have more experience and familiarity with the risk assessment process for combustion facilities.

X. CONCLUSION

EPA remains committed to the principle that the best approaches to hazardous waste minimization and management will be most easily found and implemented in a spirit of cooperation and partnership among the interested parties. To that end, EPA will continue to serve as a chief catalyst for broad and open discussions among all interested parties and, in particular, to foster a full and open relationship between RCRA facilities and their surrounding communities.

As stated in the Draft Strategy, EPA is keenly aware that, ultimately, we serve the public. Our mission under RCRA, and that of the authorized states, is explicit -- we must assure protection of human health and the environment. However, generators of hazardous waste and facilities that store, treat or dispose of hazardous waste should continue to improve relationships with their communities. Members of the public must be assured -- not just by word but also by deed -- that their well-being is of paramount concern to those that have responsibility for managing hazardous waste safely.

APPENDIX A

ACCOMPLISHMENTS IN PUBLIC OUTREACH AND EPA-STATE COORDINATION

OVERALL GOALS

- ♦ Continue to facilitate an open and broad national dialogue among all stakeholders on significant hazardous waste issues. Give top EPA priority to working with states as co-regulators of hazardous waste.

EPA ACTIVITIES

- Agency commitment in May 1993 to engage the widest range of interested parties in a broad national dialogue on waste minimization and combustion issues.
- Creation of the EPA-State Steering Committee on Hazardous Waste Management, which meets to discuss significant policy issues related to waste minimization, combustion, public involvement, and other issues in the Draft Strategy.
- Press Advisory (September 1993) and Environmental Fact Sheet (October 1993) released to identify for the public the planned events and actions associated with the Draft Strategy and to identify opportunities for public involvement.
- Four-day National Roundtable on Hazardous Waste Minimization and Combustion convened in the Washington, D.C. area November 15-18, 1993. The meeting drew over 200 participants and observers and brought out the views of a broad spectrum of interests.
- A series of four one-day Regional Roundtables on the Draft Strategy and related topics held in San Francisco, Houston, Chicago, and Atlanta in April-May 1994. Approximately 500 participants and observers provided their views to EPA on a broad range of issues including pollution prevention, combustion standards, permitting, compliance and enforcement, environmental justice, siting, and risk assessment.
- Initiation of a quarterly newsletter (the "Strategy Update") in September 1994 devoted to keeping interested parties informed of on-going activities connected with the Draft Strategy. The Newsletter is currently sent to over 3000 people.
- Released for public review and comment in May 1994 a draft Combustion Emissions Technical Resource Document (CETRED) that preliminarily identified emission levels of dioxins, furans, and particulate matter (PM) from existing hazardous waste

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combustion facilities using the best control technologies and operating practices. CETRED and the comments received on the document will be included as part of the regulatory development process that will culminate, under the current schedule, in a proposed rule in September 1995 covering at least hazardous waste incinerators, cement kilns, and light-weight aggregate kilns.

- A four-day focus group meeting in September 1994 was held in Washington, D.C. to discuss the framework of and issues associated with developing the RCRA Hazardous Waste Minimization National Plan. Results of the discussions were integrated into the final National Plan.

**ACCOMPLISHMENTS IN WASTE MINIMIZATION - SOURCE REDUCTION AND
RECYCLING**

OVERALL GOALS

- ◆ Under the Hazardous Waste Minimization National Plan, reinforce strong preference for source reduction over hazardous waste management in order to reduce both the long-term demand for treatment, storage, and disposal capacity and the quantities of persistent, bioaccumulative, and toxic constituents that need to be managed. In partnership with states, industry, and local communities, pursue aggressive use of waste minimization measures with primary emphasis on voluntary actions. Afford members of the public a greater opportunity to become aware of waste minimization activities in their communities.

EPA ACTIVITIES

- Released EPA's guidance on what constitutes a Waste Minimization Program-in-Place in May 1993.
- Conducted a two-day session on waste minimization (source reduction and recycling) of hazardous waste, with particular focus on combustible wastes as part of the four-day National Roundtable in November 1993.
- In November 1993, Administrator Browner sent letters to approximately 22,000 large quantity generators of hazardous waste that were required to certify that they had a waste minimization program in place in 1991. Letters were also sent to approximately 12,000 chief executive officers of the parent corporations of those generators. The letters referenced current requirements on having waste minimization programs and encouraged the companies to make those programs available to the public.
- Conducted public dialogue on waste minimization at the four Regional Roundtables (San Francisco, Houston, Chicago and Atlanta) in April-May 1994.
- Released in May 1994 EPA's Draft RCRA Hazardous Waste Minimization National Plan, which focuses on a number of specific goals, including reducing the amount and toxicity of hazardous waste that is generated, particularly when such reductions benefit more than one environmental medium. EPA released the Waste Minimization Plan in draft form in order to have further broad and open discussions with various stakeholders before finalizing the Plan.

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- Released in 1994 for public comment EPA's Draft Methodology Document for Setting Priorities for Hazardous Waste Minimization. This methodology is a key component of EPA's National Plan.
- A four-day focus group meeting in September 1994 was held in Washington, D.C. to discuss the framework of and issues associated with developing the RCRA Hazardous Waste Minimization National Plan. Results of the discussions were integrated into the final National Plan.
- Release today of final Hazardous Waste Minimization National Plan in concert with Final Strategy announcement. The National Plan provides the framework within which EPA will conduct its waste minimization activities.
- OSW distributed to the Regions and States an Addendum to the RCRA Implementation Plan (RIP) for FY '95 discussing how source reduction and recycling can be integrated into the existing program (e.g., permits, enforcement agreements) and can be pursued in non-regulatory initiatives, such as technical assistance, training, and outreach. The approach in the RIP also seeks to take advantage of opportunities arising from the permitting and inspection of combustion facilities, as affected by the Draft Strategy.
- As part of the 1991 RCRA Biennial Report released in November 1994, EPA has included a list of large quantity generators who were required to certify that they had a waste minimization program in place in 1991.

ACCOMPLISHMENTS REGARDING ROLE OF COMBUSTION AND
ALTERNATIVE TECHNOLOGIES

OVERALL GOALS

- ♦ Maintain appropriate role for combustion, and continue to ensure that combustion and other treatment facilities reduce toxicity, volume, and/or mobility of hazardous wastes in a manner that is protective of public health. Foster the commercial development and use of alternative treatment and other innovative technologies that are safe and effective in reducing the toxicity, volume, and/or mobility of RCRA industrial process and remediation wastes.

EPA ACTIVITIES

- EPA's Technology Innovation Office (TIO) was established to accelerate the development and application of innovative hazardous waste remediation technologies. Emergence of cost effective, on-site remediation alternatives such as Soil Vapor Extraction (SVE), have eliminated some of the demand for off-site incineration capacity for remediation wastes. A number of innovative alternatives (e.g., low temperature thermal desorption, solvent extraction and soil washing) are volume reduction technologies that have reduced, but not eliminated, the quantity of materials which might otherwise require incineration.
- EPA efforts to create a hospitable environment for technology development and commercialization include:
 - The Superfund Innovative Technology Evaluation (SITE) program provides a venue for promising remediation technologies to receive technical assistance and objective third-party evaluation. A number of technologies in the SITE program have potential applicability to newly-generated wastes.
 - A grant to WASTECH, a multi-organization cooperative project managed by the American Academy of Environmental Engineers, to publish a series of 8 monographs on the state-of-practice of innovative treatment technologies
 - Establishment the Vendor Information System for Innovative Treatment Technologies (VISITT) data base, which contains vendor-supplied information on technology performance and availability.

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- The Office of Solid Waste (OSW) has begun a comparative analysis of alternative treatment technologies. This analysis will be coordinated with TIO and will provide a basis for beginning the identification and evaluation of barriers to the commercial development and use of alternative treatment technologies that can reduce the toxicity, mobility, bioaccumulation, and mass of hazardous constituents.

ACCOMPLISHMENTS IN EMISSION STANDARDS AND CONTROLS

OVERALL GOALS

- ◆ Develop and impose more rigorous controls on combustion facilities based on an assessment of available technologies and current science. Develop these controls as a coordinated effort to implement both RCRA and the Clean Air Act authorities for hazardous waste combustion facilities. Ensure that hazardous waste combustion facilities do not pose an unacceptable risk to human health or the environment.

EPA ACTIVITIES

- Entered into settlement agreement in litigation on 1991 BIF regulations, which obligates EPA to propose upgraded emission standards for all hazardous waste burners under the following schedule:
 - ▶ **Phase I:** Includes hazardous waste incinerators, cement kilns, light-weight aggregate kilns, and smelter furnaces.

Propose: by September 1995
Promulgate: by December 1996
 - ▶ **Phase II:** Includes boilers and certain other industrial furnaces.

Propose: by September 1998
Promulgate: by December 1999
- Conducted a two-day session on upgrading technical standards as part of the four-day National Roundtable in November 1993.
- Conducted public dialogue on combustion issues at the four Regional Roundtables (San Francisco, Houston, Chicago and Atlanta) in April-May 1994.
- Initiated technical studies to determine Best Operating Practices (BOPs) and emission levels for the best-controlled existing hazardous waste combustion facilities. The first phase focused on dioxins, furans, and particulate matter, and has led to the development of the Combustion Emission Technical Resource Document (see below). The second study phase will focus on metals and other hazardous air pollutants, and is being conducted during 1994 and early

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1995.

- Release in May 1994 of the draft Combustion Emissions Technical Resource Document (CETRED) that preliminarily identifies emission levels of dioxins, furans, and particulate matter (PM) that have been achieved at existing hazardous waste combustion facilities using available control technologies and operating practices. CETRED uses an approach to determining these emission levels that is derived from the MACT process under the Clean Air Act; however, the levels identified in CETRED are not MACT determinations. CETRED also contains an extensive review of the combustion technologies in use today and of their various performance characteristics. The dioxin level identified as being achieved by the best-controlled hazardous waste combustors is 0.1-0.2 TEQ ng/dscm. The PM level identified is 0.005 gr/dscf.

CETRED is the first preliminary analysis addressing technology-based emission levels for hazardous waste combustion facilities and the Draft Strategy. Following release of CETRED, EPA provided for public review and comment on the data base and the analytical process used in the document. In fall 1994, EPA began work on determining achievable metal levels by the best-controlled sources. Both CETRED and the later findings of achievable metals levels will be considered in the regulatory development process that will culminate, under the current schedule, in a proposed rule in September 1995 covering at least hazardous waste incinerators, cement kilns, and light-weight aggregate kilns.

- In May 1994, EPA released a statement of policy under the Land Disposal Restrictions (LDR) program, which clarifies that combustion of certain inorganic, metal-bearing hazardous waste streams may not represent adequate treatment and therefore can violate the LDR dilution prohibition.
- EPA's Office of Solid Waste (OSW) and the Office of Air Quality Planning and Standards (OAQPS) continue to coordinate efforts in the development of proposed rules to set emission standards for hazardous air pollutants under both RCRA and CAA authorities. These rulemakings will cover sources that are burning hazardous waste, such as incinerators, cement kilns, light-weight aggregate kilns, boilers, halogen acid furnaces, and other types of industrial furnaces.

ACCOMPLISHMENTS IN ENFORCEMENT AND COMPLIANCE ASSISTANCE

OVERALL GOALS

- ◆ Continue aggressive compliance and enforcement efforts against hazardous-waste burning incinerators and boilers and industrial furnaces (BIFs) while working with industry to ensure that EPA's regulations are understood and followed. Enhance public confidence in Agency oversight activities and facility compliance by promoting public understanding of these activities and increased opportunities for public involvement in the enforcement process.

EPA ACTIVITIES

- Since May 1993, EPA and the States have undertaken three major enforcement initiatives targeted at BIFs and hazardous waste incinerators, the first in September 1993, the second in February 1994, and the third on November 15, 1994. The enforcement actions resulted in 51 complaints and 43 settlement agreements proposing over \$31.5 million in new civil penalties, while collecting nearly \$6 million in settlement of ongoing actions.
- As part of the February 1994 initiative, the Department of Justice filed the United States government's first judicial BIF complaint against Neville Chemical Company located in Neville Island, Pennsylvania. Neville had reported that its hazardous waste feed stream contains carcinogenic metals. Because Neville Chemical Company's failure to properly monitor and control its hazardous waste feed rates, the violations could have posed a significant risk to human health and the environment. The U.S. is seeking up to the statutory maximum penalty of \$25,000 per day for each violation.
- In the September 1993 initiative, a \$3 million action was filed by the State of Illinois against Chemical Waste Management, Inc.'s hazardous waste incinerator located in Sauget, Illinois. The State's complaint cites the facility for uncontrolled fugitive emissions, including vapor, ash, and smoke, from the burning of hazardous waste.
- From March 1994 through September 1994, EPA and the States inspected 255 hazardous waste combustion facilities, or 77% of the total universe of facilities. Of the 255 inspected facilities, 115 were BIFs and 140 were incinerators. Some facilities have been inspected a number of times. According to data on BIFs supplied by EPA's Regions and incinerator

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data from EPA's RCRIS database, the inspectors noted potential violations at 77 BIFs and 47 incinerators.

- In October 1994, an OSW memorandum to EPA regions provided a comprehensive discussion of the permitting, LDR, and other related requirements applicable to intermediate transfer, storage, and/or treatment facilities that, among other things, may blend waste fuels for combustion.
- In September 1993, EPA completed a three-day workshop for State and Regional compliance and enforcement staff on inspections at hazardous waste BIFs. Similar BIF compliance and enforcement workshops were also held for Alabama and Missouri personnel in spring 1994. The Agency's compliance and enforcement office anticipates continuing its intensive training efforts on inspection and compliance at hazardous waste combustion facilities.
- On March 29-30, 1994, EPA compliance, enforcement, and permitting personnel held a compliance assistance workshop with the Chemical Manufacturers Association to answer specific questions raised by CMA members on the BIF regulations. EPA will release a transcript of the workshop in December 1994 or early 1995.

**ACCOMPLISHMENTS IN PUBLIC INVOLVEMENT IN PERMITTING PROCESS
AND ENVIRONMENTAL JUSTICE**

OVERALL GOALS

- ♦ Enhance public involvement opportunities in the process for considering permit applications for combustion facilities. Take appropriate actions to ensure that local communities are fully informed about the RCRA decision-making process (including waste minimization opportunities) and have an opportunity to participate in that process.

EPA ACTIVITIES

- EPA's Office of Solid Waste met with representatives of various stakeholder groups in October 1993 to discuss possible changes to RCRA permitting regulations to enhance opportunities for earlier and more effective public involvement.
- Administrator Browner issued a memorandum on March 16, 1994 to EPA's Environmental Appeals Board (EAB) directing that the EAB give highest priority to review of Regional permit decisions that deny a final permit for an interim status incinerator or BIF. The memorandum further directs the EAB to render a decision to the extent practicable within 90 days after the appeal is filed.
- Conducted public dialogue on permitting and public involvement at the four Regional Roundtables (San Francisco, Houston, Chicago and Atlanta) in April-May 1994.
- Publication on June 2, 1994 of EPA's proposal to change its RCRA permitting regulations to provide for earlier and more effective public involvement in the RCRA permit process. The proposal also contained changes to permit procedures to better address facilities that fail trial burns during interim status. In addition, EPA also issued a memorandum to the Regions at that time encouraging them to immediately implement the provisions to the maximum extent legally permissible. This memorandum will afford the public expanded opportunities for involvement in the permit decision-making process prior to time the rulemaking is finalized.

The proposed rule has two major themes: 1) earlier and expanded public involvement, and 2) strengthening the permitting procedures, particularly for combustion facilities.

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Public Involvement -- Key components of the expanded opportunities for public involvement in all RCRA permits include: (1) facility required to hold a pre-application meeting with the affected community prior to submitting their RCRA permitting application; (2) notice of receipt of permit application by the permitting authority; (3) EPA may require permit applicants and permittees to establish public information repositories in close proximity to the facility site; and (4) public notice of trial burn conditions and scheduling would be required.

Permitting Improvements -- Key components of the strengthened permitting procedures for incinerators and BIFs include: (1) agency approval of the trial burn plan for interim status units prior to the actual burn; (2) limiting post-trial burn operations to only those conditions that the facility successfully passed; (3) narrowing the opportunity to operate based on submittal of data in lieu of performing a trial burn; and (4) providing clearer regulatory authority on denial of a permit application if the facility cannot pass its trial burn. Note that the trial burn failure guidance, which dovetails with this portion of the proposed rule, was released in July 1994.

- As part of overall Agency task force to address environmental justice issues, OSWER Assistant Administrator Elliott Laws convened a RCRA-CERCLA-UST task force in 1993. After working closely with representatives from all ten EPA regions, as well as members from environmental justice community groups, labor unions, academic institutions and industry groups, the OSWER Environmental Justice Task Force in April 1994 completed a draft final report recommending various approaches to identify and address environmental justice issues.
- In April 1994, OSWER Assistant Administrator Elliott Laws established an inter-office Siting Task Force to identify the options available for addressing various concerns related to siting of RCRA hazardous waste facilities. The Task Force explored options that ranged from setting technical location standards to enhancing public information and input as a matter of increased environmental justice. The Task Force reported to the OSWER AA in August 1994 with respect to its findings. Following the report, the OSWER AA directed work to begin on a proposal to upgrade the RCRA location standards. The Task Force continues to meet and to report progress in developing other siting options to the OSWER AA.
- OSW is in the early stages of developing a methodological

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approach or approaches for assessing the racial and ethnic makeup and income levels of neighborhoods around facilities that represent several industrial sectors. The results of this effort are expected to provide tools that will help OSW identify various aspects of environmental justice issues in its future regulatory and non-regulatory projects.

- OSW is also exploring, in conjunction with EPA's Office of Environmental Justice, means by which the dialogue with Native American tribes can be enhanced and facilitated regarding their environmental justice concerns.

ACCOMPLISHMENTS IN FACILITY PERMITTING PRIORITY

OVERALL GOALS

- ♦ Give higher priority to those facilities for which a final permit decision would result in the greatest environmental benefit or the greatest reduction in overall risk to the public. Give lower priority to permit decisions on new combustion facilities that are not replacing older facilities.

EPA ACTIVITIES

- Incinerator Universe -- EPA's latest census as of November 1, 1994 shows 162 permitted and interim status incinerators in the hazardous waste combustion universe. An additional 26 proposed facilities (including 7 demilitarization and 2 remedial units) are also potentially in the universe.

Since May 1993, 8 non-commercial onsite incinerators withdrew from the universe of permitted facilities (most units had not been built); 8 commercial facilities withdrew plans to add capacity, and 4 interim status facilities (1 commercial and 3 non-commercial) decided to close. In addition, 7 facilities submitted new incinerator applications (1 commercial, 4 non-commercial, 1 remedial, and 1 demilitarization). One permit was issued by Texas for the American Envirotech facility. In September 1994, EPA denied the permit application for Marine Shale Processors in Morgan City, LA (now on appeal).

- BIF Universe -- EPA's latest census as of November 1, 1994 shows 136 interim status boilers and industrial furnaces in the hazardous waste combustion universe. Since May 1993, 22 interim status BIF facilities have withdrawn from the universe of hazardous waste combustors (6 commercial cement kilns, 2 commercial boiler, 13 onsite boilers, and 1 smelter). In March 1994, EPA denied the BIF permit application submitted by National Cement in Lebec, CA (now on appeal). Also in 1994, Arkansas denied a permit application submitted by Maybelline Products.
- In addition, on April 4, 1994 in response to a petition filed by the Hazardous Waste Treatment Council et al., EPA determined that: 3 facilities had never qualified for interim status (Gage Products in Ferndale, MI; ESSROC in Speed, IN; and Marine Shale in Morgan City, LA); 3 kilns at Lafarge Cement in Alpena, MI had never qualified for interim

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status; Holnam Cement in Ada, OK had qualified for interim status; and River Cement in Festus, MO complied with the certification of compliance requirements and could continue to burn hazardous waste. Boxcrow in Midlothian, TX, also discussed in the April determination, has since indicated its intent not to burn hazardous waste or to assert authority to operate under interim status.

- Since May 1993, all EPA Regions and many States have given highest priority to proceeding towards final permit determinations for operating interim status combustion facilities not yet under permit controls. Risk assessments at 18 incinerators and 13 BIFs are currently underway.
- By May 1994, the Regions and States called in permit applications for all commercial BIFs that are currently operating under interim status.
- In May 1994, EPA distributed additional guidance to Regions on trial burn procedures (particularly with respect to obtaining representative PIC levels needed for risk assessments) to assist the Regions and states in implementing the Strategy and in making final permit determinations.
- Continued examination of each facility permit application to determine whether use of the RCRA "omnibus permit authority" to apply additional permit controls beyond those required under the current regulations is necessary to ensure that emissions of hazardous constituents do not pose an unreasonable risk to human health and the environment.

ACCOMPLISHMENTS IN RISK ASSESSMENT

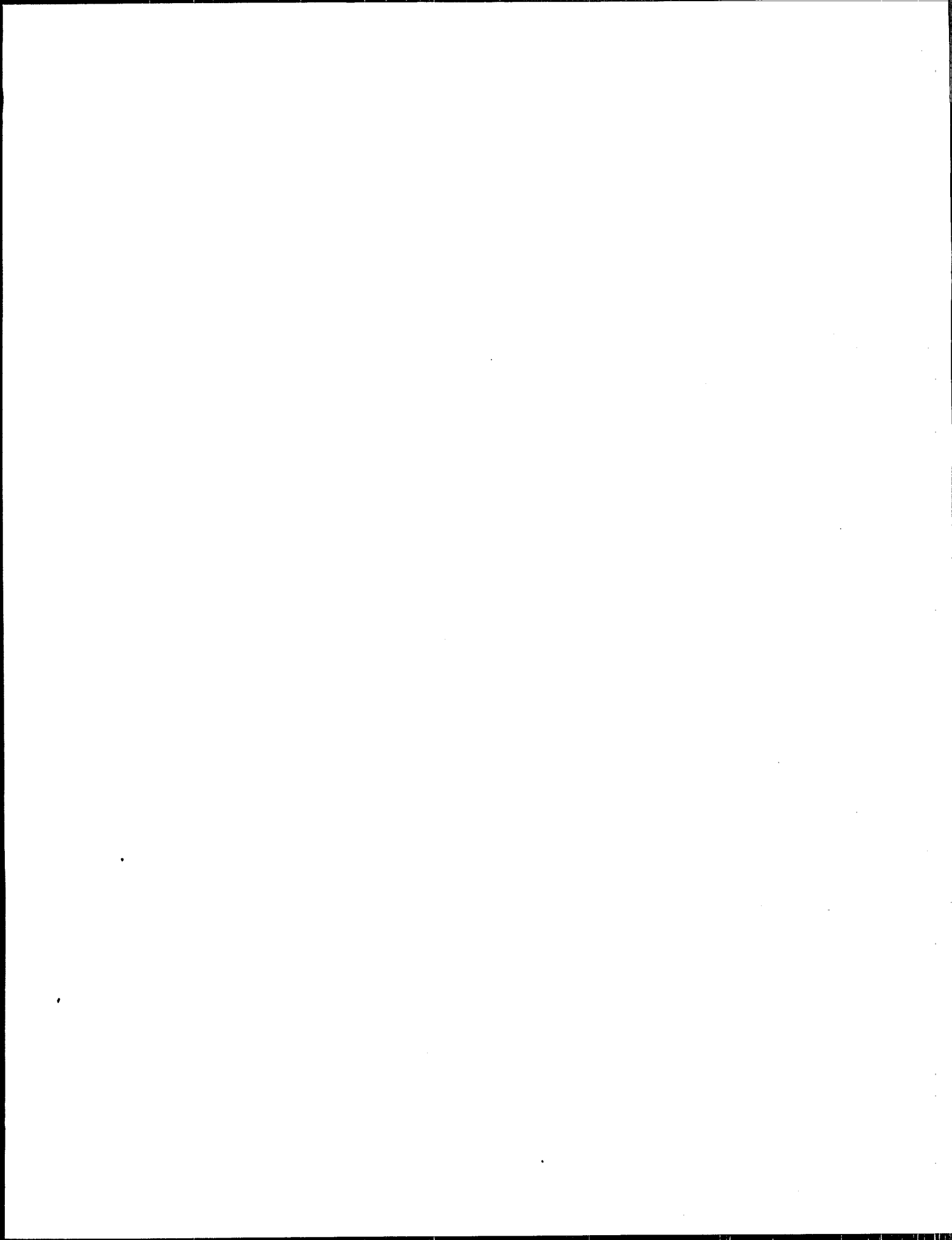
EPA GOALS

- ♦ Advance scientific understanding on combustion issues and risk assessment, and ensure that permits are issued at facilities in a manner that protects against unacceptable risks to human health and the environment. Use sound science in technical decision-making.

EPA ACTIVITIES

- Since May 1993, Regions and States have been advised of EPA's policy, as stated in the Draft Hazardous Waste Minimization and Combustion Strategy, that the permitting process for hazardous waste combustion facilities should include a full risk assessment that covers indirect as well as direct exposure pathways.
- In November 1993, EPA released for review, by the public and the Science Advisory Board, the Draft Addendum to update the Agency's 1990 guidance document on conducting indirect exposure risk assessments. Public and SAB comments are being considered at the present time, and the Agency is working to revise the full guidance document (including the Addendum) in light of those comments.
- In May 1994, EPA released its current implementation guidance for conducting risk assessments for RCRA combustion facilities. The document provides specific, detailed methodologies for conducting risk screening assessments as well as a revised list of hazardous constituents to be evaluated. In addition, the guidance also contains revised information on how to plan and conduct trial burns in light of the information needed to conduct the indirect risk assessments called for by the Draft Strategy. The Agency plans to issue a revised version of the risk screening methodology by early 1995.
- OSW has constituted a risk assessment technical group to assist Regions and states in conducting risk assessments at RCRA combustion facilities. This technical assistance group is comprised of risk assessment experts from EPA's Office of Research and Development (ORD), the Office of Solid Waste, and Regional offices.
- OSW and ORD have participated with the Regions in reviewing several of the initial risk assessments performed after announcement of the Draft Strategy in May 1993.

APPENDIX B



Appendix B -- Strategy for Hazardous Waste Minimization and Combustion

VOLUNTARY INITIATIVES IN RESPONSE TO DRAFT STRATEGY

The Draft Strategy on Hazardous Waste Minimization and Combustion posed a challenge to industry. After its announcement, EPA asked companies to step forward and meet the objectives of the Draft Strategy even without regulatory or other mandatory requirements. In particular, industry was challenged to create opportunities for potentially significant environmental actions.

While a number of companies and organizations explored different options, several stand out from the rest in terms of an early commitment to take significant environmental steps. These include:

American Portland Cement Alliance (APCA) and the Cement Kiln Recycling Coalition (CKRC)

The APCA and CKRC are cooperating with the Agency on a project to provide data and information on several issues pertinent to establishing emissions standards for hazardous air pollutants for cement kilns. Under this project, testing and data gathering would begin in winter 1994-95. In addition, the CKRC has agreed to undertake an information-gathering effort from its members regarding, among other things, the concentrations of metals in waste streams being combusted as fuel in cement kilns. Contact: Craig Campbell, 202-789-1945.

Ash Grove Cement

Ash Grove Cement is cooperating with the Agency in a testing program to evaluate the effectiveness of reducing dioxin and furan emissions by rapidly controlling kiln-off gas temperature by air and water quenching. The tests will also measure dioxin and furan emissions at the kiln exit (i.e., as well as in the stack) to determine the extent of dioxin/furan formation in the kiln itself rather than downstream in the ducting and particulate matter control device. This testing is scheduled for January-February 1995. Contact: Eric Hansen, 913-451-8900.

Continental Cement Company, Inc.

Continental Cement has investigated approaches to reduce dioxin and furan emissions. Continental has replaced its previous source of shale raw material with a source that contains much lower levels of organic matter, and has substantially reduced emissions of both total hydrocarbons and dioxins/furans. The Company has also performed emissions testing to evaluate various approaches to further lower dioxin/furan emissions, including rapid quenching of the kiln off-gas temperature and injection of material to inhibit

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the post-combustion formation of dioxin/furans. Additional testing is planned for fall-winter 1994. Contact: Ron Powell, 314-221-1740.

ECOVA

ECOVA has developed an innovative community involvement approach in connection with its facility in Kimball, Nebraska, and proposed to make this available to another combustion facility seeking to modify and upgrade its units, with the objective of providing an improved model for all other facilities to use in enhancing the level of public information and involvement at the community level. Contact: Elliott Cooper, 303-279-9712.

Eli Lilly and Company

Eli Lilly and Company proposes to upgrade an incinerator unit at a facility in Indiana with new air pollution control devices that would meet prospectively more stringent EPA standards well in advance of their final promulgation. Testing of the upgraded unit against an otherwise identical unit would be conducted to develop data on the degree of emission controls. Strengthened waste minimization efforts (to reduce incinerator loadings) would also be included. Contact: Ron Pitzer, 317-276-6196.

Lafarge Corporation

Lafarge has had preliminary discussions with the Agency regarding cooperating in a testing program at a cement facility. The testing would include evaluating and sharing data on: (1) the effectiveness of reducing dioxin and furan emissions by rapidly cooling kiln-off gas temperature and by injecting materials that may inhibit post-combustion formation; (2) the relationship between chlorine levels in feed streams and dioxin/furan emissions; and (3) emissions of organic compounds to characterize the emissions as completely as reasonably possible. Contact: David Carroll, 703-264-3652.

National Association of Chemical Recyclers (NACR)

NACR undertook a comprehensive data-gathering effort to determine the life-cycle flow of metal-bearing waste streams from generation through treatment ultimately to combustion. In addition, the NACR membership developed and adopted a detailed plan to implement their Responsible RecyclingSM principles. Contact: Chris Goebel, 202-434-8740.

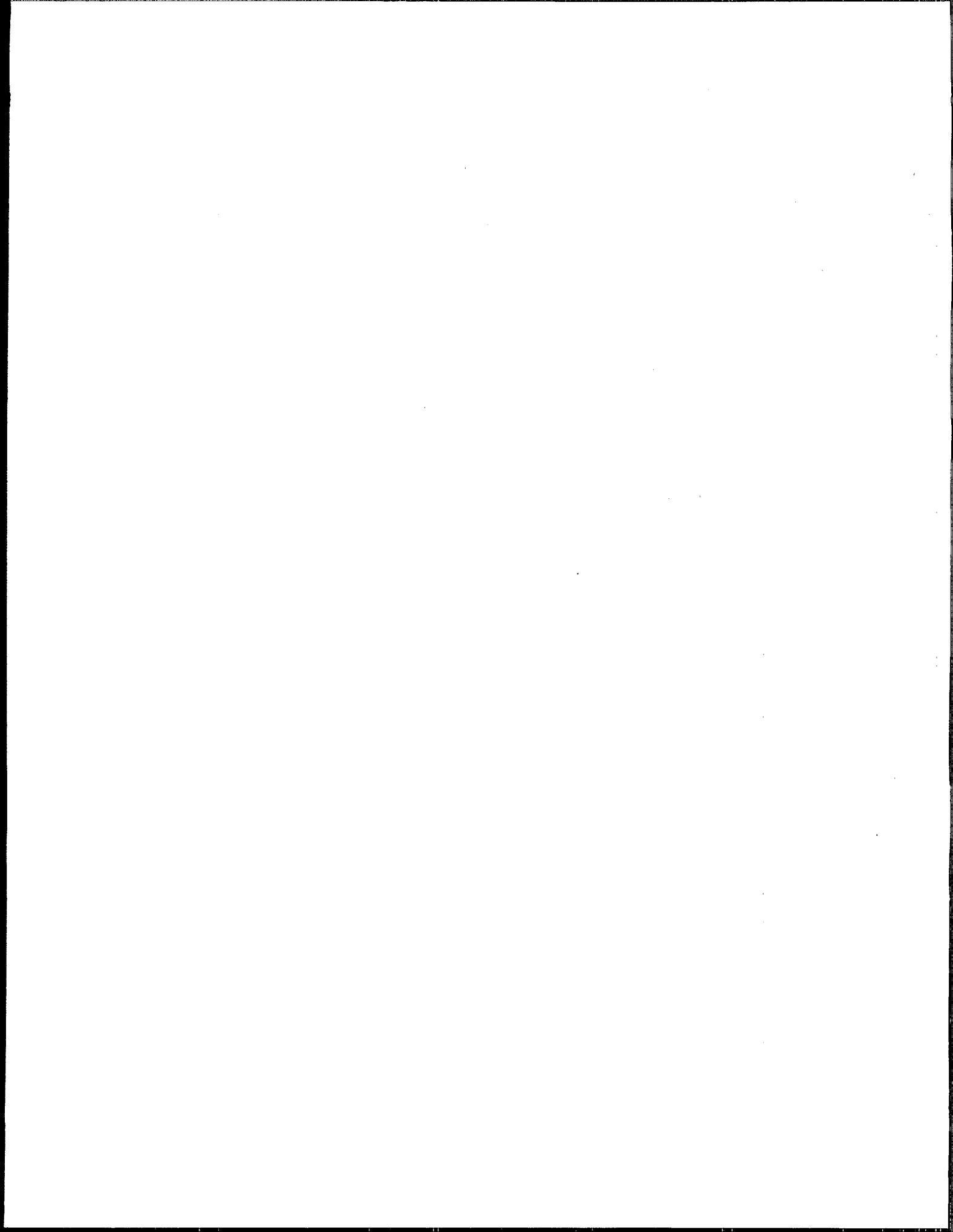
Rollins Environmental Services

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Rollins is cooperating with the Agency in a testing program to evaluate alternative control devices to lower emissions of toxic metals and particulate matter (PM) at a commercial incineration facility in concert with achieving low dioxin emissions. The air pollution control system currently in place at Rollins' facilities uses a variety of wet scrubbers that effectively control dioxin (to less than 0.1 ng. TEQ) and acid gas emissions, but does not control PM or metals to comparable levels. Testing of continuous emissions monitors for PM is also planned as part of the testing program. The testing is scheduled for January 1995. Contact: Phillip Retallick, 302-426-3948.

Southdown, Inc.

Under the leadership of Southdown, Inc., a consortium of private companies have joined together in a non-profit venture to work with EPA to expedite development and commercial availability of reliable continuous emission monitors (CEMs) for metals, an important technical advancement that should significantly improve real-time emission monitoring capability. Contact: Edgar Marston, 713-650-6200.



APPENDIX C



Appendix C -- Strategy for Hazardous Waste Minimization and Combustion

**BACKGROUND FOR EPA'S STRATEGIC GOALS -- HAZARDOUS WASTE
GENERATION AND MANAGEMENT**

I. Hazardous Waste Managed in RCRA System

Based on 1991 Biennial Report Survey (BRS) data, of the 306 million tons of hazardous waste reported as generated in 1991, 294 million tons were managed as follows:

**TABLE 1. Hazardous Waste Management Practices in the United States
(based on 1991 BRS data)**

MANAGEMENT METHOD	TONS OF WASTE MANAGED (Millions)	PERCENTAGE OF TOTAL
Aqueous Treatment	206	70%
Other Treatment (e.g., neutralization, settling, evaporation)	32	11%
Deep Well Injection	23	8%
Solvent Recovery	4	1%
Combustion (Incinerators and BIFs)	3	1%
Landfill and Land Treatment	2	1%
Other (e.g., metal and other recovery, sludge treatment, stabilization)	24	8%

II. Current Volumes of Hazardous Waste Being Combusted

Combustion of hazardous waste is currently an integral and controversial component of hazardous waste management in the United States. It has reached this position as the nation moved away from land disposal in the 1980's and into an era of treatment to reduce waste volume and toxicity. According to 1991 BRS data, approximately 3.4 million tons of hazardous waste are combusted in incinerators and BIFs, and another 0.6 million tons are burned in metal recovery and smelting furnaces. The types of wastes going to these devices can be broken down as follows:

TABLE 2. Quantities of Hazardous Waste Managed in 1991 in Incinerators, BIFs, and Other Industrial Furnaces (in tons)

CURRENT MANAGEMENT METHOD	ORGANIC LIQUIDS	ORGANIC SOLIDS AND SLUDGES	AQUEOUS LIQUIDS	INORGANIC SOLIDS AND SLUDGES
Metal Recovery and Smelting	54,000	6,000	5,000	490,000
Incineration	520,000	110,000	800,000	105,000
BIFs	1,200,000	340,000	1,000	5,000
Total	1,774,000	456,000	806,000	595,000

¹ These numbers do not contain the amount of waste sent to combustion from small quantity generators.

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III. Universe of Hazardous Waste Incinerator and BIF Facilities

The RCRA combustion facility universe², as of November 1, 1994, can be broken down as follows:

TABLE 3. RCRA Combustion Facility Universe (as of November 1, 1994)

Facility Type	Permitted	Interim Status	Proposed	Total (Potential Universe)
Commercial Incinerator	21	7	5	33
Non-Commercial Incinerator	120	14	21	155
Commercial BIF	0	38	1	39
Non-Commercial BIF	0	98	2	100
Remedial ³	0	0	2	2
Chemical Munitions Incinerator ⁴	2	0	7	9

This universe has been somewhat dynamic since the Draft Strategy was released. The following changes have occurred over the last 16 months. Some of the key changes that have occurred include:

Incinerators

- o 8 permitted on-site incinerators (non-commercial) have withdrawn from the universe.
- o 7 commercial and 1 demilitarization incinerators have cancelled plans to develop new capacity.
- o 4 interim status incinerators decided to close (1 commercial; 3 non-commercial).
- o 7 new incinerator applications were submitted (1 commercial; 4 non-commercial; 1 remedial, 1 demilitarization).
- o 1 authorized state incinerator permit was issued (American Envirotech in Texas).
- o 1 incinerator permit application was denied (Marine Shale

² This universe does not contain any figures for mobile incinerators or those being used as on-site units at Superfund remediation sites.

³ Although shown separately in this row, these facilities are included in the incinerator numbers shown above in the chart.

⁴ Although shown separately in this row, these facilities are included in the incinerator numbers shown above in the chart.

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Processors in Louisiana, now on appeal).

BIFs

- o 22 interim status BIFs withdrew from universe (6 commercial cement kilns; 2 commercial boilers; 13 onsite boilers; 1 smelter).
- o 1 commercial cement kiln cancelled plans to burn hazardous waste.
- o 1 commercial boiler and 1 non-commercial industrial furnace submitted new applications.
- o 1 cement kiln permit application was denied (National Cement in California, now on appeal), and 1 on-site BIF application denied (Maybelline Products in Arkansas).

A number of upcoming permit actions and other changes are anticipated. However, because many of these permit determinations involve risk assessments being conducted in authorized states, it is difficult to develop an accurate estimate of the number of final permit determinations that will occur within given time frames. EPA estimates that around 20 (but perhaps up to 40) permit determinations will be made annually over the next several years. Also at this point, EPA has information from states indicating that some 30-40 risk assessments are under way. However, no trial burn plans have been approved by the regions or the states within the last year.

IV. Combustion Capacity Based on Universe of Current and Proposed Facilities

Based on 1991 BRS data and other information (e.g., joint EPA-industry surveys), EPA estimates that about 3.4-3.6 million tons of hazardous waste are being burned annually. In assessing the total combustion capacity that could be made available, EPA estimates that about 3 million tons of off-site commercial capacity exist. Unfortunately, EPA does not have reliable and complete information on the amount of on-site combustion capacity, but we do know that about 1.8 million tons are being burned on-site. Using this 1.8 million tons as representing total capacity (a conservative approach), then the total annual combustion capacity would be 4.8 million tons at a minimum. Since the amount being burned is around 3.4-3.6 million tons, it appears that at least 1.2-1.4 million tons (or about 35%) excess capacity exists. However, this is likely to be somewhat of an underestimate because, as noted above, the Agency does not have good information on unused capacity at on-site incinerators and BIFs.

With respect to combustion capacity, it is important to note that capacity can be limited for certain types of waste, most likely due to unusual physical form or particular constituents (e.g., explosive waste, mixed radioactive waste). In terms of future capacity, the hazardous waste treatment and disposal market has generally responded in a fashion that has thus far assured adequate combustion capacity. In addition to technical, economic, and political factors, perhaps the principal uncertainty (and therefore a potential impact on the ability of markets to respond) is whether there will be a short-term problem regarding remediation wastes. These wastes can be generated in substantial amounts over much shorter time periods, with less advance knowledge than most of the industrial process wastes, and are not usually amenable to waste minimization.

